A.D. 1867, 26th March. N° 869.

Stoppers for Bottles, &c.

LETTERS PATENT to Alexander Southwood Stocker, of 69, Lamb's Conduit Street, in the County of Middlesex, for the Invention of "IMPROVEMENTS IN THE MANUFACTURE OF STOPPERS TO BE APPLIED TO BOTTLES AND OTHER RECEPTACLES."

Sealed the 24th September 1867, and dated the 26th March 1867.

PROVISIONAL SPECIFICATION left by the said Alexander Southwood Stocker at the Office of the Commissioners of Patents, with his Petition, on the 26th March 1867.

I, ALEXANDER SOUTHWOOD STOCKER, of 69, Lamb's Conduit Street, in the County of Middlesex, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN THE MANUFACTURE OF STOPPERS TO BE APLLIED TO BOTTLES AND OTHER RECEPTACLES," to be as follows:—

The Invention has for its object improvements in the manufacture of stoppers to be applied to bottles and other receptacles, and relates, firstly, to the employment of a plastic compound composed of glue, resin, oil, water, and whiting, or of a plastic compound analagous thereto, such plastic compound being operated upon by dies and pressure to produce stoppers of the forms and characters herein-after described.

When producing a stopper to be applied to the neck of a bottle or other receptacle having a screw or its equivalent formed thereon I employ

dies having moveable centre pins with a screw or its equivalent formed on the upper end of each of such pins, so that when a stopper has been formed by the descent of the upper die or plunger compressing the plastic compound around the screw and the plunger has been again raised, the centre pins, with the stoppers thereon, may be raised and removed from the dies and placed on one side until the plastic compound of which the stoppers are formed has become partially dried or set, when they may be removed from the screwed pins and completely dried by exposure to the air or otherwise, as may be found convenient; or plain stoppers may have screws or their equivalents fixed therein by forming them separately.

Another description of stopper may be formed by combining a cork with a head piece of the plastic compound herein-before described. For this purpose I place a cork in a hole formed in the centre of the lower die, and projecting somewhat into the cavity formed by the dies; a quantity of the plastic compound is then placed in the lower die, and the upper die or plunger is caused to descend and compress the plastic compound around the cork, thereby securely connecting the cork to the head piece. If desired a suitable cement may be applied to assist in connecting the head piece to the cork, or the head piece may be separately formed in the manner above described, and the cork may be afterwards cemented thereto; or I form a stopper in the form of a plug to enter the mouth of a bottle or other receptacle, and cover the plug with cork cemented thereto.

I ornament stoppers formed of the plastic material herein described or of other plastic material by combining pigments or coloring matters with the compound, or by coating the stoppers with suitable coloring materials, or I finish them by applying a coat of varnish, which acts as a protecting medium to the material of which the stopper is composed.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Alexander Southwood Stocker in the Great Seal Patent Office on the 26th September 1867.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, Alexander Southwood Stocker, of 69, Lamb's Conduit Street, in the County of Middlesex, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-sixth day of March, in the year of our Lord One thousand eight hundred and sixty-seven, in the thirtieth year of Her

reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Alexander Southwood Stocker, Her special licence that I, the said Alexander Southwood Stocker, my executors, administrators, and assigns, or such others as I, the said Alexander Southwood Stocker, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN THE MANUFACTURE OF STOPPERS TO BE APPLIED TO BOTTLES AND OTHER RECEPTACLES," upon the condition (amongst others) that I, the said Alexander Southwood Stocker, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Alexander Southwood Stocker, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

My Invention of improvements in the manufacture of stoppers to be applied to bottles and other receptacles relates, first, to those descriptions having screw threads or their equivalents produced in their inner peripheries agreeing with the male screws or other provisions made on the necks of the vessels intended for their reception, and consists in the employment of such plastic compounds or materials as will be suitable for the manufacture of stoppers for bottles and other receptacles provided with screws or their equivalents therein, and in operating upon and in producing out of such plastic compounds or materials my improved stoppers by the aid of dies and pressure and the process or processes herein-after explained. It may be here stated that covers for bottles with screws provided therein have been hitherto made of wood turned in a lathe, which have been commercially and most extensively used, and which my Invention is intended to supersede. The principal plastic compounds or materials which I employ to the greatest benefit consist of glue, resin, oil, water, whiting, and pigments (the latter being only used for the purpose of coloring the mass), well worked up together, which mixture is known and in every day use for various purposes; and glass or other analagous plastic

compounds or materials found to be tough and strong, possessing sufficient tenacity to yield to the processes, I employ for producing my improved stoppers with their screws or their equivalents therein of sufficient strength to be useful.

My improved process of manufacture consists of a pair of dies, which may be so shaped as to form almost any curve, shape, contour, or outline of stopper intended to be produced. Through the bottom die I provide a plain hole of a desirable diameter, into which at its upper side I place a partially screwed pin, which has a shoulder provided thereon, and which by its own weight drops down, finding a resting place on the surface of the bottom die. This pin is provided with a plain hole of a desirable diameter therein, into which is placed another pin, which in like manner to the former has a shoulder provided thereon, the upper part of which having been made of a desirable shape, thickness, and diameter for the purpose intended will by its own weight also find its resting place and shoulder down upon the upper surface of the screwed pin. The top die agreeing with the other half of the stopper intended to be produced in its contour and outline will by the motion of the machine in which the apparatus is intended to be permanently fixed, and after the plastic material has been placed therein, fit down upon the bottom die, giving the stopper its proper figure in its outline, and at the same time produce the screw or its equivalent within in the most perfect manner for use. The smaller pin affords great facility in releasing the cap from the screwed pin by causing an air passage therethrough. With each die I employ a series of pins, such being portable are lifted by the action of a lever fixed underneath, when they, with the completed stoppers thereon, are instantly removed, another set of pins placed in equal short space of time in the die, and so on. The operation is continued with great ease and rapidity, the employment of many or a series of pins with each one pair of dies is of great moment, because such mode of procedure admits of their removal with the stopper thereon, and placed on one side to partially dry, when the completed stopper may be safely removed therefrom, the pins again falling into use taking their places in due time with their companions, whereas in the absence of such provision being made much time would be lost by the plasticity and constitution of some of the materials employed being such as not to admit of the immediate release of the stopper after it has been operated upon without destroying its mathematical truth.

And in order that my Invention may be more fully understood and readily carried into effect I will proceed more fully to describe the same.

Description of the Drawings.

Figure 1 is a section of a stopper *a*, formed of plastic material, and having a screw a^1 formed therein by the means hereafter described, such stopper being suitable to be applied to the neck of a bottle having a screw thread formed on the outside thereof; Figure 2 is a section of dies or apparatus suitable to produce the stopper shewn at Figure 1, such being here shewn in the position they would assume preparatory to being charged with a suitable quantity of the kind of plastic material intended to be used. *a* is the lower die; *b* is the upper die, and *c* is a central pin, on the upper end of which a screw thread c^1 is formed; *d* is a small pin in the centre of the pin *c*, c^1, to facilitate the removal of the stopper therefrom by allowing air to enter at that part.

In the manufacture of stoppers by the aid of these dies or apparatus a suitable quantity of the kind of plastic material intended to be used is placed in the lower die *a*; the upper die *b*, by the pressure it receives by a suitable machine or apparatus into which the dies are intended to be permanently fixed, falls down on to such plastic material until the dies or apparatus assume the position shown at Figure 3, when the upper die *b* is again raised and a suitable instrument acted upon by the foot or otherwise, as will be well understood, acts upon the lower end of the pin *c* and raises it out of the lower die with the stopper thereon, when the stopper may be readily removed from the screw c^1, or the pin with the stopper thereon may be removed and placed on one side until the plastic material of which the stopper is formed has cooled or set (according to the character of plastic material employed) sufficiently to enable it to be handled and removed from the screw c^1. It will be readily understood that the apparatus shown at Figures 2 and 3 would have stops provided by the machine into which they are fixed to prevent the faces of the dies being injured by being brought into forcible contact with each other.

Figure 4 is a vertical section and Figure 5 is a front elevation of a machine or apparatus in which the dies and screwed pin are placed in a reversed position to those shown at Figures 2 and 3; Figure 6 shows the parts in the position they would assume at the moment of forming a stopper. In these views *d* is the lower die, which is adjusted in position immediately under the centre of the upper die *e* by being pushed into the V guides f^1 formed on or fixed to the bed plate *f* until it comes against the screw stop f^2, which is capable of adjustment as shown. The upper die *e* is

fixed to the cross head g, which is capable of being raised by a treadle acting upon the lever h, which by links h^1 is connected to a cross head i connected to the cross head g by rods k passing through suitable guides f^3 formed on or fixed to the bed plate f, which, as will be well understood, would be fixed to a suitable framing or table; a suitable weight connected to the link i^1 acts to bring the cross head g with the upper die e down into the position shown at Figure 6, where it is held firmly till the completion of the stopper by the forcing down of the moveable screw e^1 on to the plastic material placed in the dies or apparatus, which is effected by giving a turn to the wheel e^3 fixed on the upper end of the moveable pin e^2, to the lower end of which lock nuts e^4 are fixed, acting as stops to limit the amount of motion given to the moveable screw e^1.

The following is the mode in which a screwed stopper is formed by means of the apparatus shown at Figures 4, 5, and 6:—The lower die d is removed from its position under the upper die e for the purpose of being supplied with a suitable quantity of plastic material; it is then returned to its position under the upper die e, as shown in the Drawings; the upper die e is then allowed to descend on to the lower die d, where it is securely held by the weight attached to the link i^1, whilst the moveable screw e^1 is by giving the wheel e^3 a turn forced on to the plastic material; the stopper now having been formed the moveable screwed pin is moved upwards and out of the stopper by giving the wheel a turn the upper die e is then raised by means of a treadle acting upon the lever h, and the stopper removed, and the operation repeated with great rapidity; or plain stoppers may have screws or their equivalents fixed therein when formed separately.

Figure 7 shows a section of another form of stopper constructed according to my Invention. In this case k is the head piece formed of the plastic compound herein-before referred to; l is a cork, which is connected to the head piece k at the time of forming such head piece in the following manner:—Similar means, process, or processes are employed for the manufacture of this stopper, with the exception that instead of employing the moveable screws a cavity is left in the die, into which a cork l is introduced, such cork projecting somewhat into the space enclosed by the dies when they are in the positions shown at Figure 3; a suitable quantity of plastic material is then placed in the lower die, when the upper die is forced down on to the lower die, thereby forming the head piece k, and at the same time by compressing the plastic material around the cork l securely connecting the head piece k and the cork l together; or the head piece may be formed separately and the cork afterwards cemented or otherwise affixed thereto; or the plastic material may be moulded

entirely of the shape of this stopper and afterwards coated with sheet cork on its outer surface, as shown by red lines in Figure 7.

Having thus described the nature of my Invention, and the mode in which I carry the same into effect, I would have it understood that I do not confine myself to the precise details herein shown and described; but what I do claim is,—

Firstly, the manufacture of stoppers of the form and character shown at Figure 1 by the aid of dies and pressure, substantially as shown and described with respect to Figures 2, 3, 4, 5, and 6 of the Drawings annexed.

Secondly, I claim the manufacture of stoppers such as that shown at Figure 7 of plastic material, substantially as herein shown and described.

In witness whereof, I, the said Alexander Southwood Stocker, have hereunto set my hand and seal, this Twenty-sixth day of September, in the year of our Lord One thousand eight hundred and sixty-seven.

ALEX^{R}. S. STOCKER. (L.S.)

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1867.

A.D. 1867. MAR. 26. Nº 869.
STOCKER'S SPECIFICATION.

FIG. 1.

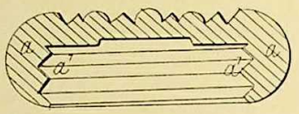
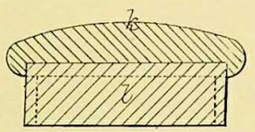


FIG. 7.



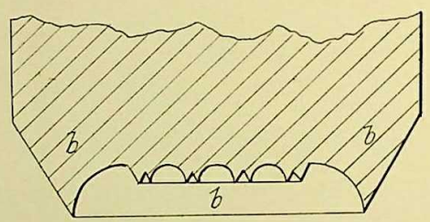
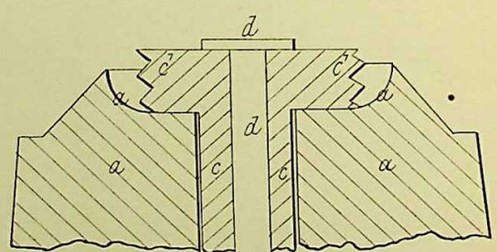


FIG. 2.



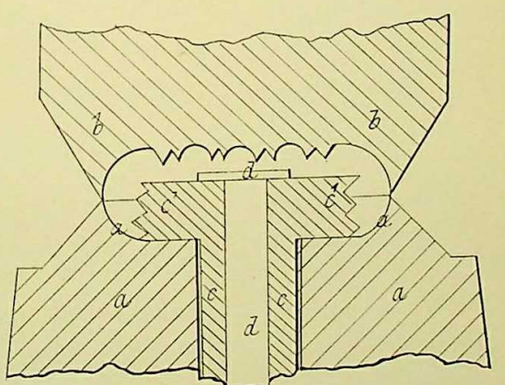


FIG. 3.

The filed drawing is partly colored

Drawn on Stone by Malby & Sons.

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1867

FIG. 4.

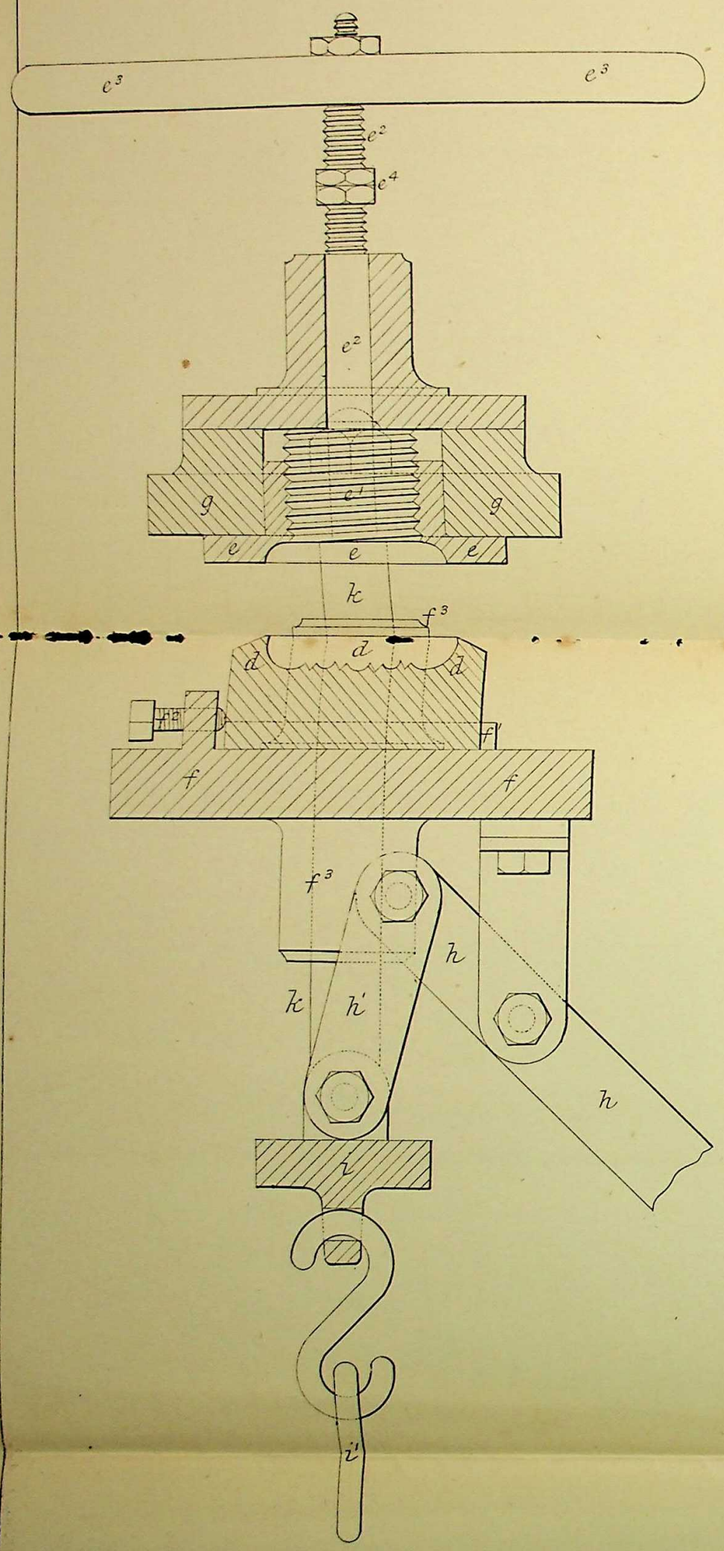


FIG. 5.

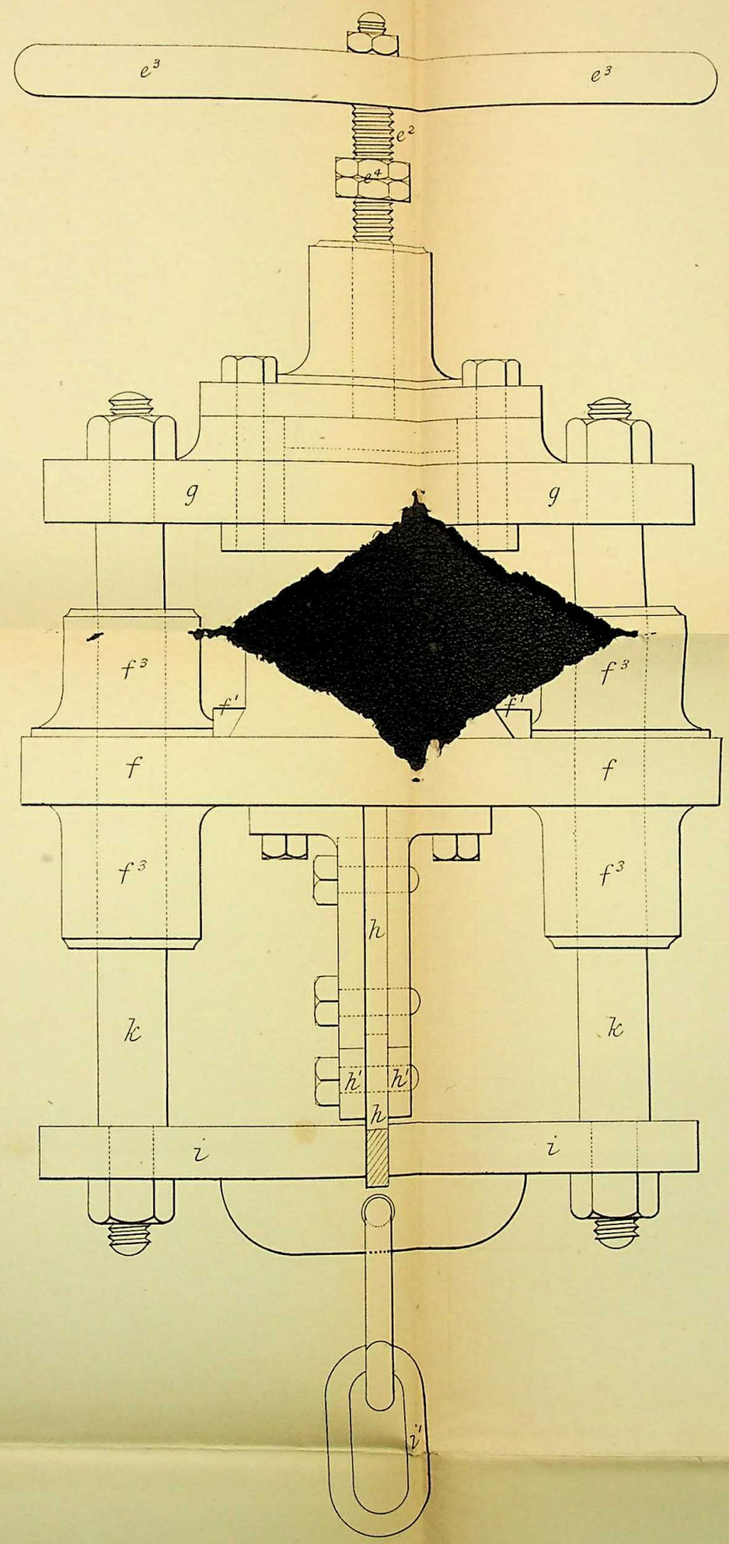
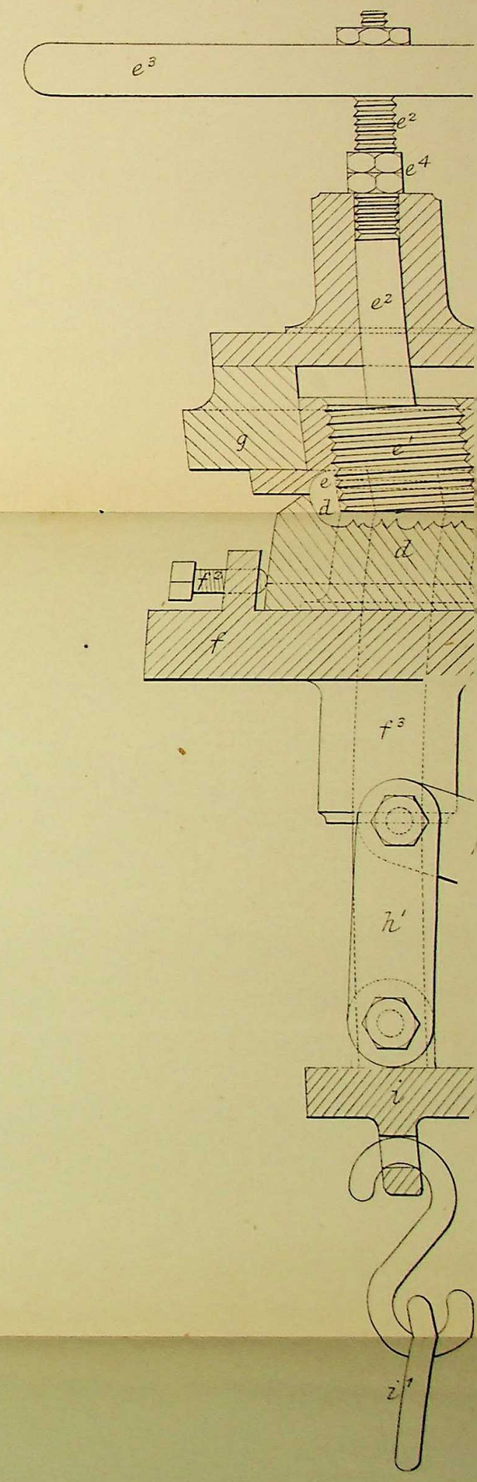


FIG. 6.



The filed drawing is partly colored.

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1867

Nº 869.
'ICATION.

G. 4.

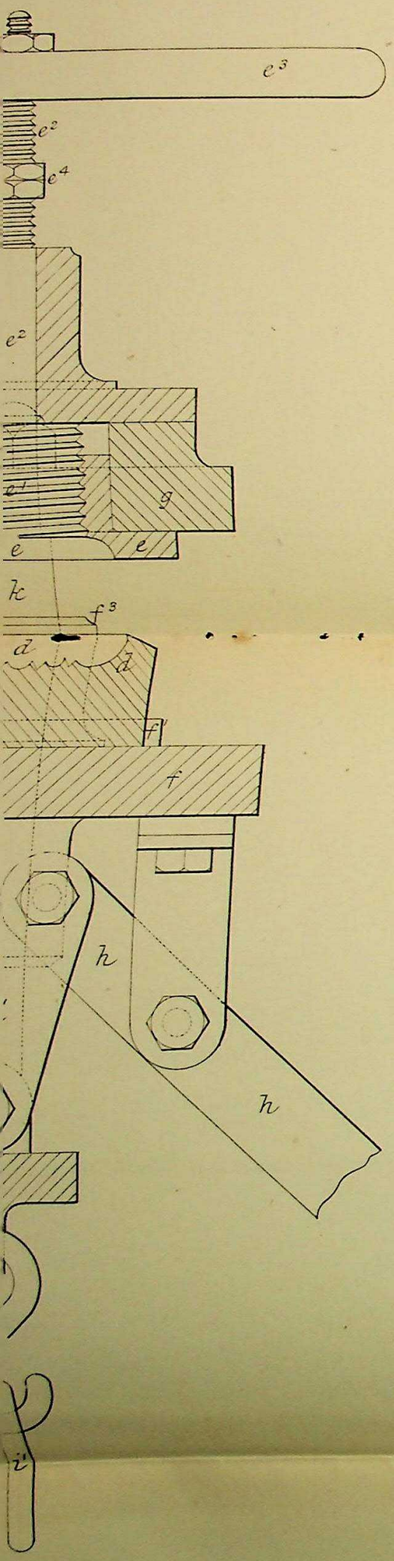


FIG. 5.

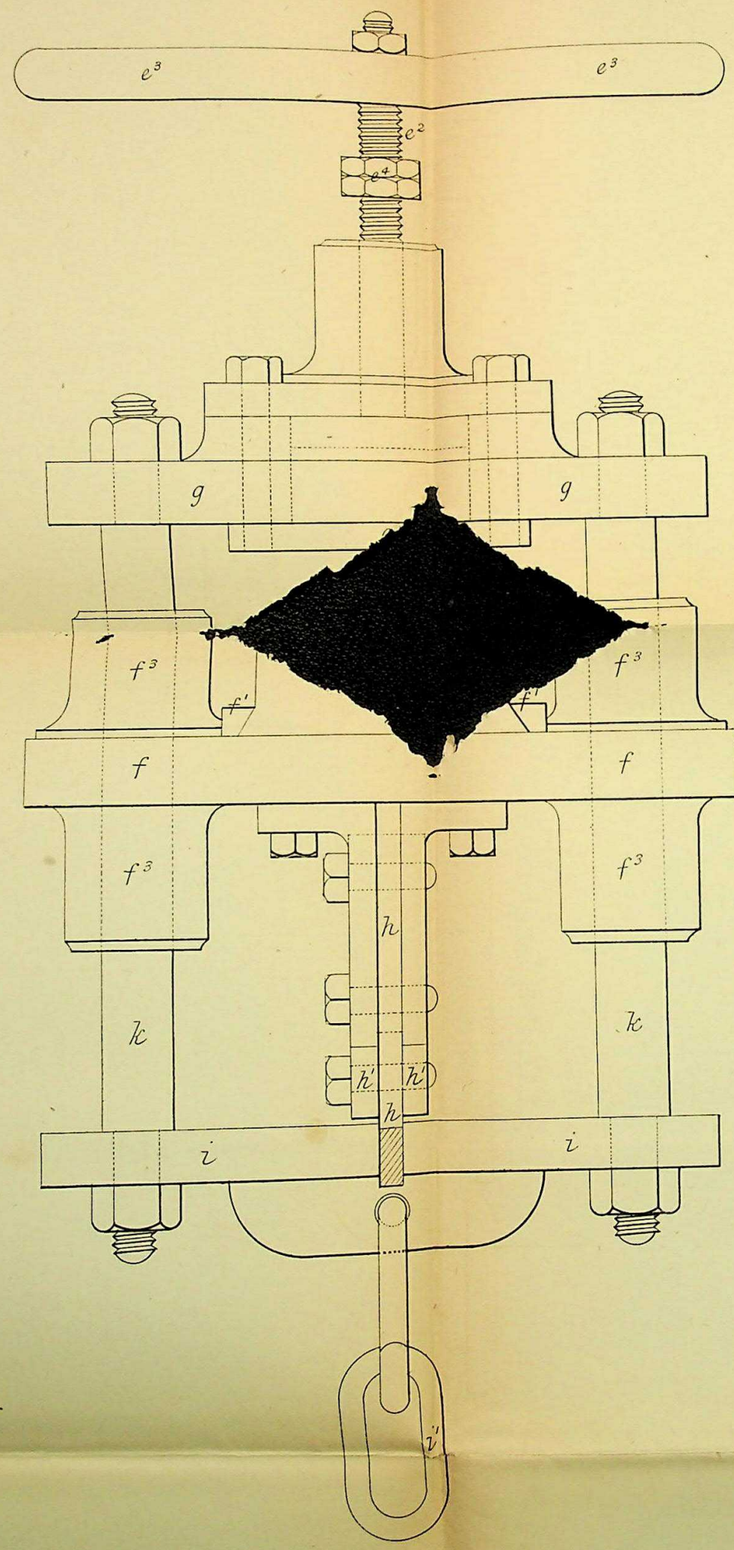
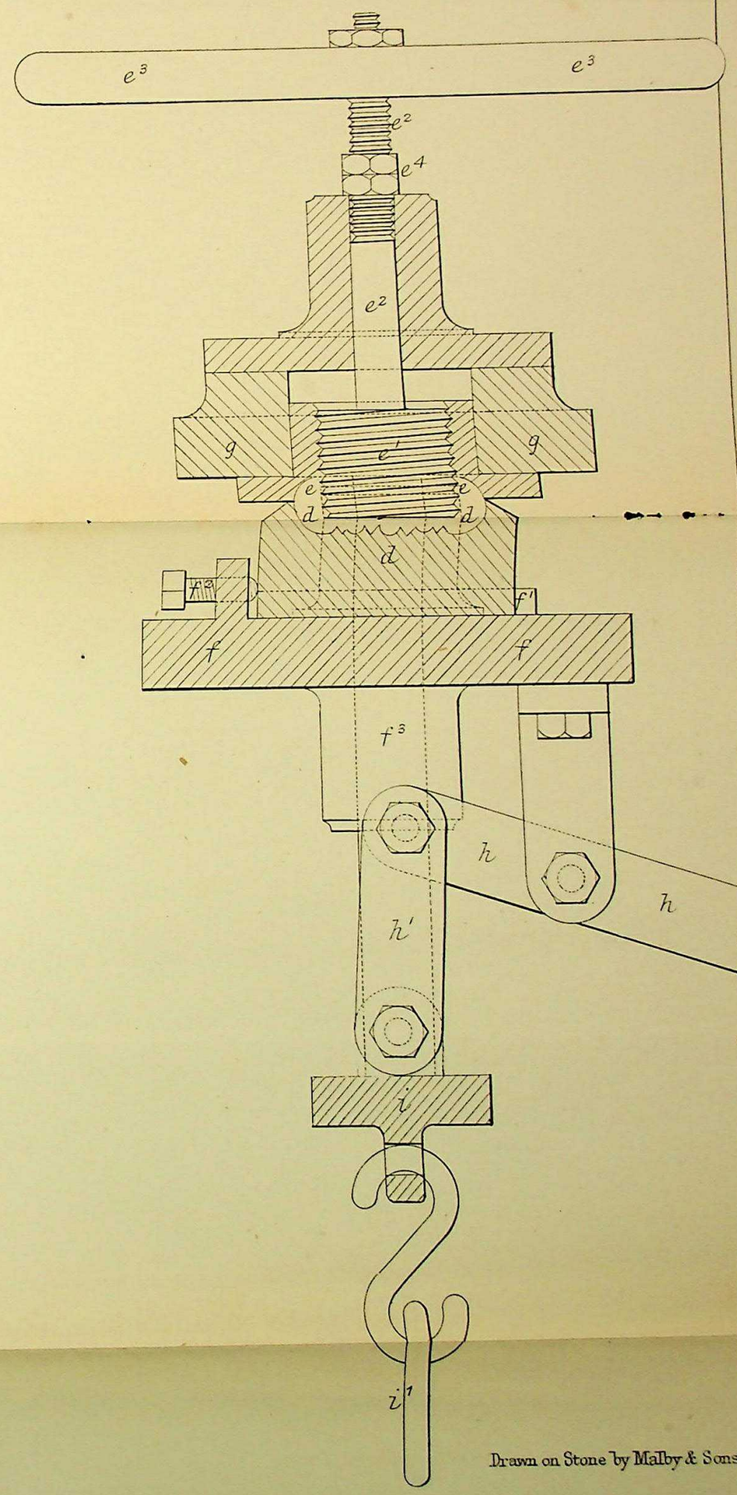


FIG. 6.



ly colored.

Drawn on Stone by Malby & Sons

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1867